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Multiwavelength Time Series Data of the LMC Cluster Reticulum

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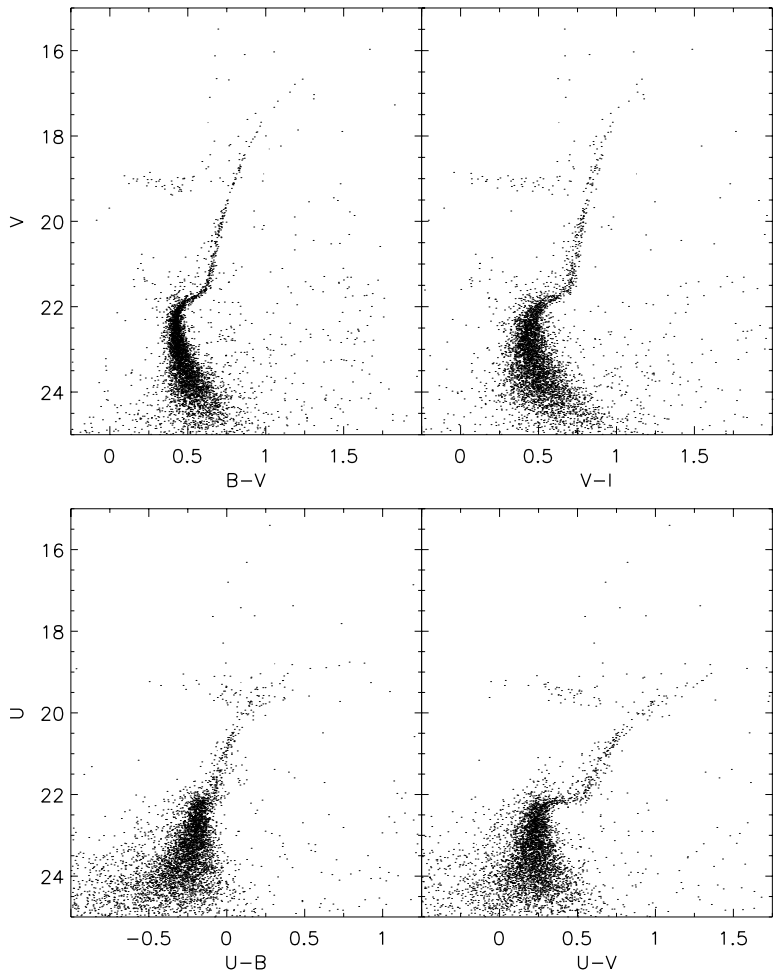
Abstract. We present accurate multiwavelength UBVI time series data of the LMC cluster Reticulum. Data cover a time interval of ≈ 6 yr and have been collected with SUSI1/2 and SOFI at NTT/ESO. For each band we collected approximately 30 short/long exposures and the total exposure times range from roughly 3500 (U, B), 6000s (V) to 8300s (I). The observing strategy and data reduction (DAOPHOTII/ALLFRAME) allowed us to reach a photometry accuracy of 0.02 magnitude from the tip of the Red Giant Branch well below the Turn-Off region. Even though this cluster presents a very low central density ($\rho_0 = 1.0 M_{\odot}/pc^3$), we found a sizable sample of Blue Stragglers (BSs). We also selected stars with a variability index larger than 2, and interestingly enough we detected together with the RR Lyrae stars a large sample of variable stars around and below the TO region. Preliminary analysis on the luminosity variation indicate that these objects might be binary stars.

1. Preliminary results

The LMC cluster Reticulum presents several interesting features, such as low-reddening (E(B-V) = 0.03 ± 0.02), low-central density ($\rho_0 = 1.0 M_{\odot}/pc^3$), accurate metallicity estimates ([Fe/H] = -1.71 ± 0.09), and a sizable sample of RR Lyrae stars (Walker, 1992). Moreover and even more importantly it is marginally affected by field contamination since it is located at approximately 11^o from the LMC bar (l =269^o, b=-40^o). In spite of these undisputable advantages only a few investigations have been devoted to this cluster. In fact, after the pioneering work by Gratton & Ortolani (1987) accurate photometry for both the RR Lyrae and the bright static stars was provided by Walker (1992). In this paper we present some preliminary results concerning the Reticulum stellar content well below the Turn-Off (TO) region. Data plotted in the figure show quite clearly that this cluster shares the same evolutionary features of old LMC



clusters (Olsen et al., 1998). In this context it is worth mentioning the sizable sample of BSs we detected. They can be easily identified in the V, B-V and in the U, U-V diagram. Thanks to the accuracy of current data it seems that they can be split into a hotter and a cooler group. The former one is located at $V \approx 21.5$ and $B - V \approx 0.25$ while the latter at $V \approx 21.5$ and $B - V \approx 0.5$ mag. Finally we note that BSs in the U, U-B diagram appear, as expected, cooler than sub giant branch stars [1].

References

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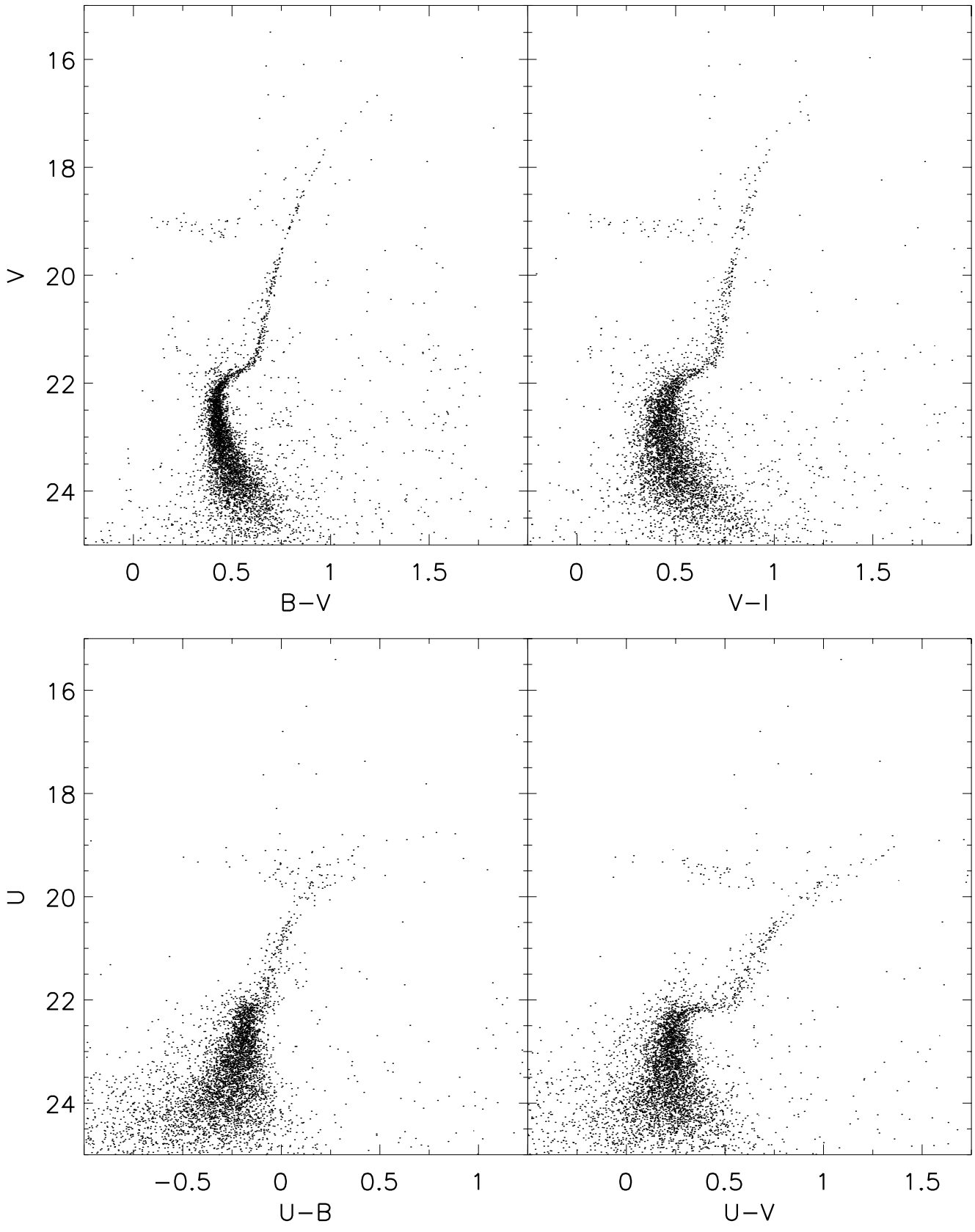
16
18
20
22
24
V
0
0.5
1
1.5
B−V
0
0.5
1
1.5
V−I
16
18
20
22
24
U
−0.5
0
0.5
1
U−B
0
0.5
1
1.5
U−V